

**USGS Award Number G15AS00016**

Final Technical Report

National Geological and Geophysical Data Preservation Program  
(NGGDPP)

**Cataloging, Scanning and Preserving Select Petroleum Collections at NM Bureau of  
Geology and Mineral Resources**

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## Abstract:

New Mexico Bureau of Geology and Mineral Resources (NMBGMR) houses many unique and valuable resources. Many of these resources for the petroleum industry are underutilized because they have not been catalogued. Two of these collections are the Neill Wills scout ticket and sample description reports (NGGDPP Collection P750 and P758). These two datasets contain data on wells drilled as early as 1919 and are unique descriptions of wells and cuttings. These sample descriptions can be quite detailed showing lithology, tops, and the wells' drilling history. Due to the age of these collections the data is starting to show signs of degradation and need to be preserved. The inventory for P753, a collection of lithologic descriptions in vertical format, was completed in 2010 but a new donation to this collection was added later. The records added to the collection needed incorporating and indexing before being integrated into the existing collection.

In 2015, we proposed to continue entering data and complete a previously uncatalogued collection. The order of priority for the collections was:

Priority	Collection ID	Est. Records to catalog (at time of August 2015 )
1	P 753 Strip Logs	1,000
2	P 758 Sample Descriptions	500
3	P 750 Neill Wills Scout tickets	12,000

The first priority was incorporating the new strip logs (P753) since this data is a relatively small, but important, donation to the collection. We then proposed to completely catalog NGGDPP Collection P758 sample descriptions and then lastly finish cataloging Collection P750 Neil Wills scout tickets. As of 2015, only 4,300 records had been cataloged for P750 and P758 had not been cataloged at all.

At present, Collections P758 Sample descriptions and P753 Strip Logs have been completely archived. This year, 2,256 new wells and 4,352 new logs were added to the strip log collection (P753). P758 has a total of 3,075 records. Funding from USGS was used to buy file folders so each individual record in this collection is in a folder, correctly labeled, and easy to get to. We have succeeded in archiving at least 50% of P750 Neill Wills collection in archival grade page protectors with labels.

Work for the year was to enter data into an internal Access database and archival preservation. Archival preservation was done on all the collections in some form. Several of the strip logs from P753 were brittle and tearing. P758 was reorganized by well and location then placed into individual folders with archival grade labels for easy access. P750 received archival grade page protectors and labels to preserve the brittle paper records.

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## Introduction:

The project, “Cataloging, Scanning and Preserving Select Petroleum Collections at NM Bureau of Geology and Mineral Resources,” began on August 1, 2015 and ended on August 1, 2016. The work on this project was undertaken using USGS award number G15AS00016 to NM Bureau of Geology and Mineral Resources (NMBGMR) a Division of NM Institute of Mining and Technology (NMT). NMBGMR is the state geological survey of NM. Total funds under this award were \$25,446. \$12,723 was the federal share and \$12,723 for the cost share provided by NMBGMR.

In 2015, we proposed to incorporate a donation of strip logs (P753) into our existing collection. This data constitutes a relatively small but important collection. We then proposed to finish cataloging NGGDPP Collection P750 (18,000+ records) and catalog

P758 (estimated at 517 records). As of 2014, only 4,300 records had been previously cataloged for P750 with NGGDPP funds. P758 had not been cataloged at all. As a result of the work done during this award period the donation of logs for Collection P753 Strip Logs have been completely archived and integrated into our existing collection. 2,256 new wells and 4,352 new logs were added to the strip log collection. Collection P758 Sample Descriptions was completely cataloged and archived during the year. Funds from USGS were used to buy legal sized file folders so each individual record is in a folder correctly labeled and easy to access. There are a total of 3,078 sample descriptions. We have succeeded in archiving at least 50% of P750 Neill Wills collection and placed all cataloged records in archival grade page protectors with printed labels.

Funding from USGS NGGDPP allowed us to hire New Mexico Tech (NMT) students to assist in data entry. According to NMT policy, students were only allowed to work up to 20 hours a week unless it was during break when they worked up to 40 hours. During the period of March to June 2016, when two students were employed to work more than the estimated 15 hours per week that was allotted in the award, Project Supervisor hours were not charged to the contract to ensure sufficient funds for student work.

## Objectives

The objective of the proposal was to complete three collections. The collections were in order of priority:

- Priority 1: P753 Strip logs
- Priority 2: P758 Neill Wills descriptions of cuttings and other well data
- Priority 3: P750 Neill Wills scout tickets and well histories.

The table below shows the status of these collections. More detail for each collection can be found in the Progress and measure of success section.

Collection by priority	Est. records	Total new records added	Issues	Status
P750 Strip Logs	1,000	4,352	Took longer than expected. It was originally estimated to be only 1000 logs. Started August 1, 2015 completed Jan 1, 2016. Data entry and record preservation by Angelo Santomenna.	<b>Complete.</b> Records have been incorporated into existing collection. Data preservation of taping and labeling torn sections was done.
P758 Sample descriptions	500	3,078	Took longer than expected. Data entry and preservation by Kayla Hanson and Benjamin Baugh. Started August 2015 completed May	<b>Complete.</b> All records have their own file folder with labels.

			2016.	
P 750 Neill Wills Scout Tickets	12,000	4,972	Smaller collections were given priority resulting in this collection not being completed.	~50%. Completed through 21S 26E. Benjamin Baugh is to finish cataloging this collection over summer and fall semesters 2016.

## **Methodology:**

### *Cataloging*

The process for cataloging all collections being added to our internal database:

1. Searching our Access database to see if a well record for the well existed.
  - a. If the record existed, the record type was entered into its associated access table.
  - b. If the well did not exist in the database, state records and NMBGMR paper scout tickets were checked for documentation for the well.
2. After documentation was found, the well was added to our database and the record type was entered into its associated access table.
3. If the well could not be documented, it was placed to the side with a note as to the most data found to be looked at later with different resources.

### *Location Criteria*

NMBGMR used the criteria that the well must have been actually drilled and not an abandoned location. NMBGMR (NM Bureau of Geology and Mineral Resources) paper records and the Oil Conservation Division (part of NM Energy Minerals Resources Department) website (<https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx>) were used to find most of the evidence. Other wells were drilled as petroleum or stratigraphic test wells pre-1930 and then converted to water wells so no record was found at the state level. These wells were located using on BLM's Geocommunicator's topographic map server (<http://www.geocommunicator.gov/GeoComm/>), but had very little information in any of our records. Other wells had the wrong point location and every effort was made to find the well with searches by name, location, operator, and well history book. Wells completed pre-1930, were entered into the Access database with a comment about any location problems.

### *Data Entry*

Each well record had the following information typed or added to each well entry.

- 1) Standard from previous years (2009-2011):

- Record type: Core, Cutting, Petroleum log file numbers, and check boxes for types of other records (i.e. DST, Strip Log, Other Records, and Neill Wills).
- API- Unique ID for petroleum wells. Effort was made to find API's for all the petroleum wells, however several of these wells don't exist in the state's records as having been drilled. These wells were quite often drilled pre-1930 and were never assigned an API number.
- Type-of well. Petroleum, Water, etc. If it was petroleum the following was also noted: what did it produce, was it plugged and abandoned or dry.
- County
- State
- Original Operator, Well Name, Well Number
- Location Information: Township, Range, Section, Footage in section, Latitude and Longitude Information
- Total and Plug back Depths

2) New data entered to metadata: (With a total number of 10,306 entries prepared for metadata, we focused on adding these data fields to only new wells.)

- Basin: NMBGMR has received queries by basin in the past and felt this would be helpful information.
- Quarter section location: Some wells only have quarter section locations and no distance from section line locations.
- Unit Letter: New Mexico's short hand for quarter quarter locations in a section. For example a well located in G-6-17S-30E, would be found in the SW NE part of section 6 in township 17S range 30E. The figure below shows how NM locates unit letters in a section.

UNIT LETTERS AND  
SUBDIVISIONS OF A SECTION

D NW/NW	C NE/NW	B NW/NE	A NE/NE
E SW/NW	F SE/NW	G SW/NE	H SE/NE
L NW/SW	K NE/SW	J NW/SE	I NE/SE
M SW/SW	N SE/SW	O SW/SE	P SE/SE

- Elevation by type: Ground Level, Derrick Floor, Kelly Bushing and Unspecified elevations were entered by their type. This metadata is located in the 'Abstract' field in the files uploaded to USGS.
- Completion date: When the well was completed. This field was used as the Date field for metadata upload. This was entered for new wells and for wells that data was added to for the three collections.

- Other operators: What other names and operators were used for this well at different times in the well's history.

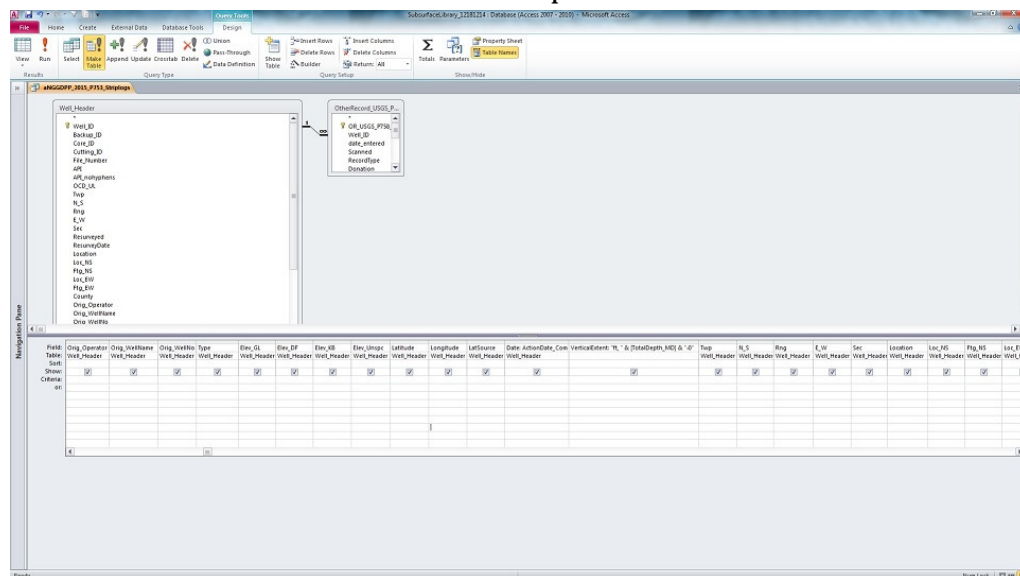
### 3) Individual record set data

- Gross Top (start of the record)
- Gross Bottom (bottom of the record)
- Date of record collection
- Descriptor of the type of data found on record

### Metadata upload:

All data for this collection was originally entered into Microsoft Access. At the completion of the project in June, the principle investigator created a query to copy the data to another Access database in as close to the required metadata format as possible. This was for archival purposes so all data for the project was easily accessible.

1. Example of query in this case for Collection P750 Neill Wills. This gets all the data needed for the Metadata into one spot.



2. Select Make Table in new database.
3. Convert dates from MMDDYYYY to YYYYMMDD, using the following code in a query for the new tables: `DatePart("yyyy",[date]) & If(DatePart("m",[date])<10,(0 & DatePart("m",[date])),DatePart("m",[date])) & If(DatePart("d",[date])<10,(0 & DatePart("d",[date])),DatePart("d",[date]))`
4. Created report. Microsoft access has the capability of generating reports in Excel format. This allowed me to finish manipulating the data into the format needed for the Metadata form.

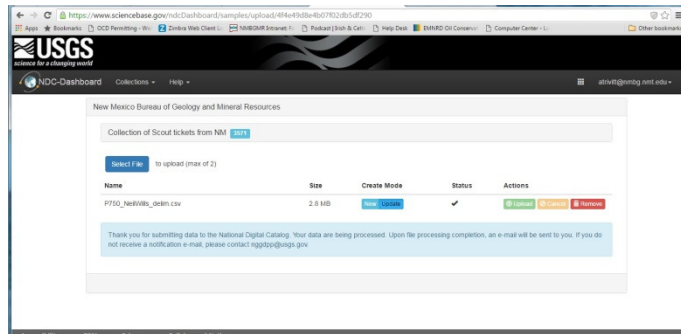


[illegible]

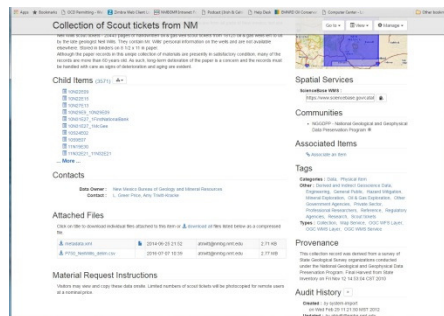
P750	30-015-05114_WellID_10831_08-17S-31E	StriplogWID_1083117S31E08	Arco #18, Petroleum, , , TD: 3232, Description: Location Drilling Tops, LatSource: PRRC	Paper Reports	Located at NM Bureau of Geology Petroleum Records. Primary Contact: 575-835-5139	-103.898488295,32.8544495662	08-17S-31E 660N 660W	20110622	ft, 3232-0
P750	30-015-04744_WellID_33809_08-25S-30E	StriplogWID_3380925S30E08	Lowe Ralph #1, Petroleum, , Oil, , TD: 3692, Description: Location DST Tops, LatSource: PRRC	Paper Reports	Located at NM Bureau of Geology Petroleum Records. Primary Contact: 575-835-5139	-103.909967618,32.1393234607	08-25S-30E 664S 667W	20110621	ft, 3692-0

- [http://datapreservation.usgs.gov/page/submit\\_data/](http://datapreservation.usgs.gov/page/submit_data/)

- Log in
- Verify permission to upload
- Update state affiliation
- Select mode update to replace existing data with new file.



- e. Wait for confirmation email.
- f. Check dashboard to see if file is there.



- g. Check uploaded data.

Collection of Scout tickets from NM [Folder View]

This collection contains the original and only copies of oil & gas scout tickets handwritten by the late Mr. Neill Wills. The information on the scout tickets came from Mr. Will...

Title	Summary	Date Modified
10N29E9_WellID_23435_10N29E09	McClintock Syndicate 1, Petroleum DA, TD 1600, Location	2016-07-13T16:41:33.967Z
11N32E21_WellID_24096_11N32E21	Holstein 1, Petroleum DA, TD 1500, Location	2016-07-13T16:39:22.806Z
26S35E31_WellID_37774_26S35E31	USGS 19M49 Potash Core Test, Potash Strat, TD 2013, Location	2016-07-13T16:42:25.053Z
3000105003_WellID_57294_9N1E22	Norris Realty 1 Pajarto Grant, Petroleum PA, TD 5104, Location	2016-07-13T16:43:10.333Z
3000105004_WellID_336_10N1E28	Carpenter F H 1 Alrisco Grant, Petroleum PA, TD 6652, Location	2016-07-13T16:38:52.131Z

## Progress and measures of success

Overall, NMBGMR feels that we have completed the 2015-2016 project year successfully. Several of these collections were significantly larger than expected but were completely cataloged and several thousand more records were added to one low priority collection. The table below shows the total number of new records added to the collections and the number of wells with new data.

Collection by priority	Total new wells with new records	Total new records added
P750 Strip Logs	2,256	4,352
P758 Sample descriptions	3,078	3,078
P 750 Neill Wills Scout Tickets	4,972	4,972

For all the collections, the records often did not contain adequate location data to generate latitude-longitude or to identify and link the records to existing wells in our collection. Over the course of the year, 2,610 new wells have been added to our internal



Presence of coloring on the strip log was noted for scanning purposes. These logs will be scanned as grey scale AND in color. Multiple scans may need to be made to get a good readable copy. Logs that were created by American Stratigraphic or the Permian Basin Library were noted so when these logs are to be scanned they will not be served online due to potential copyright issues.

When the proposal for this grant was submitted it was estimated to be about 1,000 logs and that it would take about 4 months to complete. In actuality, there were about 4,300 new logs cataloged for the NMBGMR collection in a 5 month period. See table below for statistics.

<b>P753 Strip logs</b>	<b>Contract Year</b>	<b>New Wells</b>	<b>New Logs</b>	<b>Status</b>
Un-cataloged	2010-2011	2,626	3,206	99% completed (not out of state)
Additions to catalog	2015	2,256	4,352	100%

Several of these were additions to our existing collection or were better copies of existing logs. If it was an exact duplicate, the log was not kept due to space limitations. Metadata was successfully uploaded July 12, 2016.

#### *Priority 2 Collection P758: Sample descriptions*

P758 Sample descriptions are core and cuttings sample descriptions by various geologists. Most of these physical samples do not exist in our core and cuttings libraries so there would be no other access to the samples.

From this award, we received funding to catalog and begin preservation of the collection. These records, before cataloging, were loosely organized in folders by Township, Range and Section. Quite often there would be two or three different descriptions for the same well scattered in amongst 10 records in one folder. The records are now easy to find in individual folders organized by Township, Range, Section, operator, well name and number for visitors to access. Preservation was done by each well receiving a file folder with a label that had location data, well information and well ID number. The records had the Subsurface Library well ID written in pencil to use as a cross reference in case a record gets misfiled.

This collection had several issues. The first was quantity and the second was staffing. In 2010, when the first NGGDDPP call was made for collection searches, this collection was estimated to have about 500 records in it. In actuality, there were 3,078





Neil Wills Scout tickets are the only copies made by a late independent geologist by the name of Mr. Wills. The records show day to day drilling information and lithology for many of the wells. Almost all of the sheets in this unique collection were hand written on paper from 1940 till the time of Mr. Wills' death. These sheets are brittle and tear with normal day to day handling. Cataloging of this set included the well information and descriptors of the well data on the record.

12932  
 30-125-0372  
 30-125-0372

with AP (Ford)  
 and well ID

OUR NO.  
 \_\_\_\_\_  
 \_\_\_\_\_

12932  
 30-125-0372  
 30-125-0372

with AP (Ford)  
 and well ID

OUR NO.  
 \_\_\_\_\_  
 \_\_\_\_\_

12932  
 30-125-0372  
 30-125-0372

with AP (Ford)  
 and well ID

OUR NO.  
 \_\_\_\_\_  
 \_\_\_\_\_

- Location: Township, Range, Section, footage of wells. Also includes basic information well name number, depths, elevation, and initial production.
- Drilling: Daily drilling log for well.
- Tops: Formation tops
- Lithology: Description of well.
- Core: Cored interval and often a brief description.
- DST: Drill Stem information.

For the original entry found below scanned while in its archival page protector would receive a descriptor of: Location Drilling Lithology Tops.

The image shows two pages from a well log. The left page is a header section with fields for well name, location, and other metadata. The right page is the main log section with columns for depth, lithology, and other data.

NMBGMR had set the goal to finish the collection but this was not accomplished with the unexpected size of the other two collection. Over the year all the previously cataloged records were placed in page protectors and labeled. Once that was completed, we continued entering the collection.

Before entry started in 2015, we had metadata for 3,571 wells with Neill Wills scout tickets, we managed to get another 4970 new records added by the end of June 2016. Amy Trivitt-Kracke worked on the collection from August to December 2015. Angelo Santomenna worked on the project from January 2016 until his graduation in May 2016. Benjamin Baugh finished P758 in May and has completed several hundred records for the P750 collection by mid-June 2016. The file was successfully uploaded July 13, 2016. See the table below for statistics:

P750 Neill Wills	Contract Year	Entries for contract period	Total Entries	Status
Un-cataloged	2011	3,571	3,571	35% completed
Additions to catalog	2015	4,972	8,543	~50%. All records entered into database with folders and archival labels.

### **Personnel employed on project**

The following personnel were employed on the NCGDPP NM project during the 2015-2016 project:

1. Amy Trivitt-Kracke, Petroleum Computer Specialist at NMBGMR and Project Supervisor.
2. Benjamin Baugh, Project Assistant and undergraduate civil engineering major at New Mexico Institute of Mining and Technology. March 2016-present.
3. Kayla Hanson, Project Assistant and undergraduate civil engineering major at New Mexico Institute of Mining and Technology. August 2015-March 2016.
4. Angelo Santomenna, Project Assistant and undergraduate biology major at New Mexico Institute of Mining and Technology. August 2015-May 2016.